

## SS CURTISS LAY-UP SPECIFICATION

**a. LAY-UP SPECIFICATION**

The Curtiss's crew will deactivate this vessel with minimal outside assistance. A contractor lay-up specification is not required. The lay-up will be conducted by the crew, in accordance with the lay-up plan.

**b. VOYAGE REPAIR SPECIFICATION**

Voyage repairs will be developed in specification text throughout the operational phase and reviewed with the COTR. Those items to be accomplished during lay-up will be processed via Amsea Work Orders as discussed in Section d. below.

**c. LAY UP ESTIMATES**

Our lay-up budgets are based upon past quotations for lay-up specifications and our actual commitments/cost experience in laying-up RRF vessels.

VESSEL: CURTISS			
LAY-UP (30 days)		ESTIMATE	COMMENTS
Lay-up by Amsea Work Orders	\$10,000	\$10,000	
Voyage Repairs	TBD		
Technical Representatives		\$10,000	
Subcontractors/vendors			
ABS & other Agency Inspections			
Parts and Equipment		\$20,000	
Spares/Replacements			
Crew and Crew Transportation		\$57,000	
Crew Phase-out (3 days)	\$40,000		
Transportation	\$17,000		
Miscellaneous Port Costs (Agent, Tugs, Port Charges, etc.)		\$20,000	
<b>TOTAL ESTIMATE</b>		<b>\$117,000</b>	

Note: Above estimate does not include current MARTS Deficiency Items.

# **GENERAL DYNAMICS**

American Overseas Marine Corporation

## **d. LAY-UP SPECIFICATION UPDATES**

Amsea considers the lay-up plans and specifications, living documents and will review and update as required by the contract:

- ♦ Upon completion of a Phase V Lay-up period
- ♦ yearly if no lay-ups occur

As noted in the Curtiss lay-up plan, voyage repairs and pre-lay-up sea trial items, are proposed to be handled under Amsea Work Orders. The phase "O" repair items will be discussed with the MARAD COTR as they develop.

During the operational phase, the ships crew will perform routine maintenance and repairs plus emergency repairs, which are within their capability. Repairs, which are beyond the crew's capability and can be deferred, will be developed in specification text by the crew and or by the Group Port Engineer. Ship repair item descriptions/specifications will be forwarded to Amsea. Additionally any deferred lay-up items will be addressed at this time.

## **e. LAY-UP SPECIFICATION (TO BE COMPLETED BY ROS CREW)**

The soft lay-up of the vessel will be completed by the ROS crew. The specification of the lay-up process is shown below. The crew may be designated to complete additional work if required:

### **VENTILATION OPENINGS and WEATHER DECK CLOSURES**

MCDS modules and the weather exposed equipment will be resealed using the existing prefabricated enclosures.

### **DEHUMIDIFICATION**

The accommodations and machinery spaces were previously under dehumidification. It is the intent of this item to restore this dehumidified state using the original equipment, now stowed on board.

### **FLOODING AND FIRE ALARM SYSTEM**

The flooding and fire alarm system shall be reconnected to the permanently installed 115 VAC system. The system covers the shaft alley and engine room for flooding and each DH machine for fire alarm. Flooding sensors consist of a "GEMS" type switch, mounted at the low points of the shaft alley and engine room tank tops. Fire alarm systems utilize heat sensors calibrated to activate at 150°F located over each DH machine. Flood alarm floats and fire sensors are reinstalled with the necessary watertight connection boxes, fused safety switches and marine type lighting fixtures.

### **BOILER LAY-UP**

The boilers will be layed up using the hydrazine wet lay-up method. Inspections shall be scheduled by the Chief Engineer in sufficient time to allow for a thorough inspection. No area is to be closed up prior to inspection by the Port Engineer and MARAD Surveyor. Accomplish the long term hydrazine wet lay-up of the two boilers using the electric heaters (1 per boiler), removed during activation and supplying heated air to fire sides of the boilers with desiccant back up. The boilers will be dosed with .25 liters or 15% hydrazine (Drew AMERZINE) solution

# **GENERAL DYNAMICS**

American Overseas Marine Corporation

per ton (270 gallons) of feedwater. Dosage shall also include sufficient Drew SLCC-A to raise the alkalinity to a minimum pH of 8.3. Exact dosages to be prescribed by the Drew Chemical representative furnished by MARAD.

Secure the waterside and fireside points of access with new gaskets, except for furnace hot air entry inspection and exit points. The hydrazine wet lay-up method involves filling the boiler, economizer and superheater with feed quality water treated with hydrazine and maintaining the boiler full with a head tank, or by a suitable pump. Install a head tank well above the top of the boiler. Fill the boiler to the bottom of the gage glass with feed quality water. Fill the water drum, superheater, DC heater and economizer with feed quality water via the head tank. Mix the calculated dosage of hydrazine stock solution to the water while filling the tank, allowing the head tank to drain to the boiler. This shall be accomplished by making up a valve and hose arrangement and connecting the hose to the superheater back fill connection. To prevent carryover of boiler chemicals to the superheater, the boiler shall be filled through the superheater back fill only. Water level is to be maintained in the head tank.

Place the heaters on the floor plates near each boiler front and assemble the inlet and outlet adapters on the heater. Care shall be taken when locating the heaters so as to minimize the obstruction of walkways. The connections to the furnaces shall be completed by using the inlet adapters shaped to match the or furnace opening with the duct connection at the center. The flexible duct hose shall be used to connect the heater outlet to the boiler air entry points. The filtering element shall be attached to each boiler heater air inlet to prevent debris from entering the heater and boiler.

Secure the air casing accesses. Make up with new gaskets. Prior to final fireside closure, evenly distribute 40 pounds of new desiccant, in 1 lb bags, in the furnace. Make sure bags of desiccant do not interfere with air flow from the heater. Close the waterside manholes and handholes.

The economizer tube banks are to be adequately protected from the accumulation of scale and debris that may fall down from the uptakes during lay-up. This is to be done by placing a layer of 30 oz (minimum) canvas on top of the economizer tubes in each boiler. A hole approximately 2 ft. square shall be left in the center of the tube bank cover to permit warm air flow through the economizer to the temperature controller sensing bulb. A sign is to be placed at the uptake access door to each boiler, indicating that economizer tube bank must be uncovered before firing boiler.

## **BOILER HOT AIR ENTRY AND EXIT POINTS**

Fireside Air Inlet: Furnace Access Manhole or Burner Assembly Access

Fireside Air Outlet: Base of Stack

Electric connections to the heater and blower shall be made according to 46 CFR, Part 110, Subchapter J. Connect the heater and blower to a separate circuit breaker on the main power panel that supplies power to the DH machines and alarm systems. The breaker shall be of sufficient size to permit starting the heater and blower without tripping and shall not be of such capacity to prevent tripping in the event of a short circuit or overload in the unit. Individual cut off switches shall be provided adjacent to each heater. Power cable shall be copper and the correct size for the load. Cable shall be Type SO, low smoke. Cable shall be tied up off the deck in a wire way, where possible and shall not be tied to any machinery or equipment. Cable shall not be secured or tied to any structure that would pose a hazard to personnel, equipment or machinery.

The adjustable thermostat probe shall be installed through a suitable opening in the base of the stack just above the economizer. The probe shall extend into the stack a minimum distance

# **GENERAL DYNAMICS**

American Overseas Marine Corporation

equal to 1/3 to 1/2 the distance across the stack. Connect the thermostat wires to the heater and test operate the unit. The blower shall run continuously, except when the breaker is opened. Thermostat wires shall be tied up similar to the power cable. The heater should cut on when the temperature at the probe drops to 60 deg. F +/-5 degrees. The heater should shut off when the temperature at the probe reaches 80 deg. F +/-5 degrees.

Verify proper direction of rotation of each blower. Ensure that the blower air inlet filter does not drastically reduce the air flow through the blower, which would result in damage to the heater through excessive temperatures.

Install a the permanent metal stack cover, removed at activation and secure it in place with a gasket, bolts and wing nuts. The cover shall be sealed and weather tight. Close up the access panels to the uptake areas with new gaskets, bolts and nuts.

## **DRYING AND PREPARATION OF MAIN STEAM SYSTEM**

Main steam lines will be blown down with compressed air and dried with forced hot air. Turbines and condensers will be drained and dried with forced hot air.

Remove the internals of traps on the main steam line drains, steam strainer drains and turbine throttle drains and replace bonnets. Manually open valves between the superheater outlet and the turbines except the throttle valves at turbines, which are to be tightly closed. Close the superheater outlet stop check valves and open the other main steam stop valves. Pressurize the steam main with clean, dry oil free compressed air. Individually open each drain and confirm flow. Drain until traces of moisture are gone. For solid piped drains, break the line downstream of low points to confirm dryness. Repeat this sequence as many times as required until drains blow dry as soon as they are opened. Release pressure in the steam main by opening drains.

Open steam strainers upstream of throttle valves on main and auxiliary turbines and remove, clean, inspect and reinstall baskets. Install a temporary high capacity air heater/blower to discharge into each strainer. Blowers should be provided with inlet filters. Blowers may be mounted directly on larger strainers or ducted to smaller strainers. In either case, a sheet metal transition must be provided between the strainer flange and the blower or duct flange. Install a full faced, gasketed, fine mesh screen between the strainer and transition flanges.

Remove the port and starboard superheater stop check valve bonnets and disks (protect disks and secure/stow adjacent to the valves), open other steam stops and start heater/blowers to circulate hot air through the steam lines, superheater and open steam drum manhole for twenty-four (24) hours. Check accessible locations for moisture. If moisture is found, continue drying.

Open inspection plates on condenser hotwells, jack open throttle valves, open turbine and extraction drain lines, close boiler steam stops and replace stop check valve bonnets. Circulate hot air through turbines and condensers for at least forty-eight (48) hours. Check accessible locations for moisture. If moisture is found, continue drying as many times as required.

## **MACHINERY AND PIPING SYSTEMS DRAIN AND BLOW DOWN**

Machinery on board vessel, including main engine, auxiliaries, coolers, condensers, heaters, evaporators, distillers, inspection tanks, drain tanks, filter boxes, strainers, maneuvering valves, turbines, pumps, air ejectors, etc., shall be drained thoroughly on the steam and water ends by removal of drain valve bonnets, caps, plugs, covers, drain pipes or section of piping. Tanks containing water shall be drained, opened, thoroughly dried, and closed up with new gaskets and fasteners. Equipment shall be completely dried by blowing out with air and/or wiping with

# **GENERAL DYNAMICS**

American Overseas Marine Corporation

lint free rags. All strainers shall be cleaned. Salt water heat exchangers shall be fresh water flushed and the tubes cleaned prior to drying. The end covers of, non-bronze, heat exchangers shall be cleaned, fresh water washed and coated with Apexior #3 or a similar approved product and zinc anodes renewed.

Piping systems on board vessel that potentially contain water, including those listed below, are to be drained, blown down using compressed dry air. Sufficient piping joints are to be broken to ensure low points or loops in systems are dry. Strainer baskets shall be removed, cleaned and reinstalled. Pumps shall be jacked over three times to ensure drainage of moisture. Control air is to be supplied to any component with pneumatic controls and such controls set to ensure valves are in a demand position so as to ensure complete drainage and the elimination of blind pockets in systems. Traps to be blown dry. Valves are to be exercised, freed, stems lubricated and left in a partially open position. Repack when necessary. In addition and in conjunction to the above, accomplish other work items for individual systems where specified.

Work to include, but not be limited to the following systems:

- o auxiliary steam systems
- o condensate system
- o feed system
- o firemain

Piping broken for drainage to be made up in good order on new gaskets and or jointing renewing any defective or missing fasteners.

## **FIREMAIN LAY-UP**

Prior to final draining and blow down of firemain systems. Flush system out to extent possible with fresh water. Fresh pierside water shall be connected to the firemain for future use.

## **POTABLE WATER SYSTEM PIPING/PRESSURE AND HEATING TANKS**

Pierside potable water shall be connected to the shore connections on the potable water systems for ROS crew use.

## **SOUNDINGS**

Twenty four (24) hours prior to vessels departure for lay-up site, tanks voids and cofferdams aboard vessel shall be sounded. Four (4) type written copies of the soundings and contents of tanks shall be submitted to MARAD.

## **TURBO GENERATOR TURBINE and GEAR UNIT (2)**

Disconnect throttle valve, chest, turbine and bowl drains. Insure that the lines and drains are clear and reconnect piping and leave drain valves in the open position. Remove exhaust casing sentinel relief valve, fit screening over opening with a frame in such a manner that it cannot be dislodged. Protect & secure relief valve adjacent to opening. Clean both elements of the duplex lube oil strainers. Centrifuge lube oil in sump until oil is clear of moisture. Open gear unit inspection cover, examine gears for condition. Install the fine mesh screen with coarse mesh guard screen and frame and place securely over gear unit inspection opening. Use cover on standoffs to protect screen and yet allow ventilation.

Open, clean and inspect the following:

# **GENERAL DYNAMICS**

American Overseas Marine Corporation

Governor  
Throttle trip  
Safety devices

Reassemble in good order with new gaskets.

## **TURBO GENERATOR ELECTRICAL**

Open alternator casings for ventilation. Verify operation of alternator space heaters. Drain water side of air cooler and lube oil cooler, remove heads from both the lube oil cooler and the air cooler, blow out tubes to insure that they are clear and clean. Reinstall heads.

## **MAIN PROPULSION TURBINES**

Remove LP exhaust casing manhole covers, inspect low pressure and astern turbine blading, general condition of interior and condenser tubes as can be viewed. Install protective screening to cover openings in casing with a hard edging to pass around bolting to insure that the screening will remain in contact with turbine casing to prevent the entry of foreign objects. Fit four extension studs in way of capscrews on each manhole. Studs to be of sufficient length to allow the use of two nuts per stud to mount the manhole cover a distance of one inch above the opening to serve as protection for the screening. Upon fitting screening place covers over screen allowing approximately one inch of space between screening to allow for ventilation of turbine interiors.

Disassemble turbine and chest drains and prove that they are clear and will drain properly. Reassemble drain, leaving drain valves open. Drain gland seal and leak-off systems as well as regulator bellows assemblies, insure that trapped moisture is removed. Ahead and astern throttle valves, nozzle valves as well as guardian valve are to remain in an open position. Coat/lubricate the operating mechanisms.

## **MAIN ENGINE REDUCTION GEAR INSPECTION COVERS**

Open one inspection cover from each first reduction gear housing, one cover from top of and one from opposite side of second reduction gear case.

Install the fine mesh screen with an expanded metal guard screen over it with a metal frame securely attached on the inspection openings in such a manner that it cannot be accidentally dislodged. Screen frame is to be securely locked by the locking device presently fitted at each inspection plate. This locked screen device is to be fitted to a total of four main engine reduction gear inspection openings.